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PART V

DEPARTMENT OF LABOR

Mine Safety and Health Administration

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METAL AND NONMETAL MINING OTHER THAN COAL MINING

Health Standards; Miscellaneous Amendments

[4510-43-M]

Title 30—Mineral Resources

CHAPTER I—MINE SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

SUBCHAPTER N—METAL AND NONMETALLIC MINE SAFETY

METAL AND NONMETAL MINING OTHER THAN COAL MINING

Health Standards; Miscellaneous Amendments

AGENCY: Mine Safety and Health Administration (MSHA), Department of Labor.

ACTION: Final rule.

SUMMARY: This rule establishes a definition for the term "potable water," establishes new mandatory standards with respect to silica and new mandatory standards limiting the use and storage of specified toxic or harmful chemical substances, and revises the mandatory standards related to exposure to asbestos dust. These regulations will improve health conditions to which mine workers are exposed and provide mine workers with an equivalent degree of protection as workers in other industries subject to similar hazards.

EFFECTIVE DATE: December 18, 1978.

FOR FURTHER INFORMATION CONTACT:

Dr. Aurel Goodwin, Chief, Division of Health, Metal and Nonmetal Mine Safety and Health, Mine Safety and Health Administration, U.S. Department of Labor, Ballston Towers No. 3, 4015 Wilson Boulevard, Arlington, Va. 22203, 703-235-8307.

SUPPLEMENTARY INFORMATION:

I. Rulemaking Background

Acting under the rulemaking authority of section 6 of the Federal Metal and Nonmetallic Mine Safety Act (30 U.S.C. 725) (Metal Act), the Secretary of the Interior published a notice of proposed rulemaking to amend Parts 55, 56, and 57, Title 30, Code of Federal Regulations in the Federal Register on Thursday, July 7, 1977 (42 FR 35000-35002).

The notice proposed to:

(1) Revise the definition of "potable" water;

(2) Prohibit the use or storage of certain specified toxic chemical substances except under laboratory conditions approved by a nationally recognized agency acceptable to the Secretary;

(3) Revise existing mandatory standards by reducing the 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed from 5 fibers per milliliter greater than 5 microns in length to 2 fibers per milliliter; and

(4) Prohibit silica sand or other materials containing more than 1 percent free silica from being used as an abrasive substance in abrasive blasting cleaning operations underground and allowing such use in surface activities only with the use of full-flow respiratory protection, or equivalents for all exposed persons.

A comparison was made between the language and substantive requirements of each proposed definition and mandatory health standard with the corresponding OSHA definition and regulation. In each instance, the proposed definition or mandatory health standard affords at least the same degree of health protection to the individuals working in the metal and nonmetal mining industries as its counterpart OSHA definition or regulation affords those persons working in the general and construction industries subject to the Occupational Safety and Health Act. The proposed definition and rules were developed or revised after consultation with the Federal Metal and Nonmetal Mine Safety Advisory Committee appointed under section 7 of the Metal Act (30 U.S.C. 726).

Pub. L. 95-164, the Federal Mine Safety and Health Amendments Act of 1977 (Amendments Act), amended the Federal Coal Mine Health and Safety Act, Pub. L. 91-173, and repealed the Federal Metal and Nonmetallic Mine Safety Act, Pub. L. 89-577.

The resulting law, the Federal Mine Safety and Health Act of 1977, applies to all coal and other (metal and nonmetal) mines. With regard to rulemaking proceedings which had begun but were not completed prior to March 9, 1978, the effective date of the Amendments Act, section 301(c)(3) of that Act provides the Secretary of Labor with the authority to continue the proceedings and promulgate such rules under the rulemaking authority of the Federal Mine Safety and Health Act.

II. Discussion of Comments and Changes

1. *55, 56, 57.5-1(b)—Asbestos.* Comments were made expressing concern as to the wording of proposed paragraph (b) regarding methods for asbestos fiber identification, based in part, on the conclusions of a National Bureau of Standards (NBS) report entitled "A Report on the Fiber Content of Eighty Industrial Talc Samples Obtained From, and Using the Procedures of, the Occupational Safety and Health Administration."

Among the conclusions contained in the report were: (1) It is the opinion at NBS that the existing OSHA procedure is useful only for determining "fiber" content and not "asbestos" content.

(2) The NBS believes that the resolution of the measurement problem, including the definition and identification of asbestos, will be accomplished by significant changes in the procedure and probably by changes in the method as well.

Several medical studies were referenced in the comments. T. R. Fears, "American Journal of Epidemiology" (vol. 104, pp. 523-526, 1976); McDonald, et al., "Cancer" (vol. 26, pp. 914-919, 1970); McDonald, et al., "American Review of Respiratory Disease Supplement" (vol. 115, No. 4, April 1977); Gibson, "Inserm" (vol. 52, pp. 107-116); Enterline, New York Academy of Science (February 1975); McDonald, et al., "Archives of Environmental Health" (vol. 28, February 1974); and Finklea, unpublished.

The NBS study, performed at the request of OSHA, was done for bulk materials, not airborne dust, and does not represent an analysis of the methods used by MSHA. MSHA does not use the method evaluated by NBS to identify asbestos minerals.

Presumably, the medical studies were cited to either refute the need for a standard or to argue against a reduction of the standards. The studies cited represent only a small part of the medical literature on asbestos exposure and disease. When all reports on this subject are considered, they demonstrate an overwhelming association between asbestos exposure and lung disease. Few, if any, of these reports have sufficient information to judge the specific risk of disease associated with any given exposure. The general consensus within the medical community is that any exposure to carcinogens creates a risk of disease. Therefore, standards should require exposure levels to be set as low as possible so long as they are both achievable and can be measured.

Because of scientific data developed in the late 1960's and early 1970's, the asbestos standards 30 CFR 55.5-1, 56.5-1, and 57.5-1 were amended in 1974 to provide the current limit of 5 fibers/ml greater than 5 microns (micrometers) in length. In keeping with the Secretary's responsibilities, MESA (predecessor of MSHA) continued to study the available data on asbestos dust, and as a result of these studies, in June 1976 submitted to the advisory committee a recommendation to reduce the 5 fibers/ml limit to 2 fibers/ml. The reason for the reduction to 2 fibers/ml limit is to prevent

asbestosis and to protect to a greater degree against cancer. The 2 fibers/ml limit is consistent with MSHA's current asbestos dust standard for surface work areas of underground coal mines and surface coal mines and OSHA's current standards for general industries and the construction industry. A reduction from 5 fibers/ml level to 2 fibers/ml will improve significantly the working environment of miners.

MSHA believes that the two fiber regulation is both achievable and amenable to measurement. The 2 fiber/ml standard should assure that less than 1 percent of workers, occupationally exposed, will develop clinical signs of asbestosis.

Some prominent medical and health authorities have indicated that permissible exposures up to 2 fibers/ml may still be too high to adequately protect the health of miners exposed to asbestos dust during a working lifetime. OSHA has published in the FEDERAL REGISTER and solicited comments on a proposal to reduce asbestos exposure levels from 2 to 0.5 fibers/ml for all industries except the construction industry which will be considered separately at some later date. NIOSH has recommended to OSHA an asbestos standard of 0.1 fiber/ml. Although MSHA has no present plans to implement such a further reduction in exposure levels, data and evidence will continue to be gathered and analyzed to determine if future reductions may be warranted.

It was commented that the term "fiber" as used in the regulation was not clearly defined and that the definition of "asbestos" appeared to have been designed expressly to include crushed stone operations.

The terminology for defining asbestos was obtained from mineralogists and was not designed expressly to include crushed stone operations. Crushing and grinding are performed in most mining operations, including those producing commercial asbestos, and not just at crushed stone operations.

Commenters stated that no studies have quantified health hazards resulting from exposure to asbestiform tremolite and actinolite and that there is sufficient controversy among recognized occupational health experts concerning the need to apply increasingly stringent exposure limits to all "asbestiform" minerals on the basis of carcinogenicity to warrant further careful study. They also recommended exclusion of actinolite from a more restrictive standard (i.e., less than 2 fibers/ml) unless adequate laboratory testing and epidemiological studies indicate otherwise.

In response to these comments, of the six asbestos minerals specified in the regulation, chrysotile, amosite, crocidolite, and anthophylite have been associated with increased risk of cancer in humans. Neither tremolite nor actinolite asbestos have been shown to cause cancer in humans or animals. However, studies of workers involved in mining materials containing mixtures of tremolite and other minerals have shown excess disease associated with such exposures. Tremolite and actinolite appear to form a solid solution series, representing end members of that mineral group. The promulgated standards retain tremolite and actinolite asbestos in the definition of asbestos.

It was commented that the proposed rule differed from that recommended by the advisory committee in that the phrase "longer than 5 micrometers" after the phrase "in excess of 10 fibers" had been omitted.

The omission of the phrase "longer than 5 micrometers" was a typographical error and has been corrected in the promulgated standards.

2. *55, 56, 57.5-10—Silica.* Commenters stated that the term "exposed" should be defined and that the proposed standards should have included other abrasive materials such as staurolite, garnet, and those made from slag containing a high percentage of glass.

The term " exposed" as used in regulations 55, 56, 57.5-10 refers to persons who would breathe air containing potentially harmful concentrations of silica dust originating from an abrasive cleaning operation. If abrasive cleaning is conducted in a building with forced ventilation, exposed persons would be persons in the downstream direction from the abrasive cleaning operation. If the cleaning is conducted out of doors, persons downwind of the abrasive cleaning operation may be exposed. In all cases, those persons whose exposure exceeds the applicable TLV limit in regulations 55, 56, 57.5-1 would be considered exposed. In a closed building with little or no ventilation, concentrations of harmful silica dust may persist for several hours following the conclusion of abrasive blasting. So the termination of abrasive blasting may not end the exposure.

Regulations limiting exposure to toxic substances are required under the act. It has been demonstrated that worker exposure to crystalline silica does cause silicosis. Evidence does not indicate that the health effects of such materials as glass, staurolite or garnet are as severe. However, the use of these materials is governed by other standards which may require that the same control measures be taken.

3. *55, 56, 57.5-6—Chemical storage.* Concern was expressed that "* * * conditions approved by nationally recognized agency * * *," could be interpreted to mean a laboratory accredited by the American Industrial Hygiene Association or a similar organization.

The term "nationally recognized agency which is acceptable to the Secretary" includes agencies and organizations that provide guidelines for laboratory procedures. Such organizations are the American Industrial Hygiene Association laboratories accredited by the American Industrial Hygiene Association and the Manufacturing Chemists Association.

4. *55, 56, 57.2—Potable water.* It was commented that the public health service drinking water standards, 42 CFR 72, Subpart J, are applicable only to interstate commerce, and that the Environmental Protection Agency standards published in 40 CFR 141 under the Safe Drinking Water Act of 1974, Pub. L. 93-523, should be included. The definition of "potable water" is modified in this final rule by adding 40 CFR 141.

III. DRAFTING INFORMATION

The principal persons responsible for preparation of these proposed health standards are: Thomas J. Shepich, Administrator for Metal and Nonmetal Mine Safety and Health, MSHA; Dr. Aurel Goodwin, Chief, Division of Health; and Donald R. Tindal, Counsel for General Legal Advice, Office of the Solicitor, U.S. Department of Labor.

IV. REGULATORY ANALYSIS

NOTE.—It has been determined that this document does not contain a major proposal requiring the preparation of a regulatory analysis under Executive Order No. 12044, or the Department of Labor's proposed guidelines for implementation of the Executive Order (43 FR 22915, May 26, 1978). The primary impact of new § 55.5-1, 56.5-1, and 57.5-1, pertaining to asbestos, will be upon asbestos mines and mills which contain known asbestos fibers, employing a total of approximately 1,000 workers. The total cost of compliance with these provisions is estimated to be less than $10 million during the first year.

Dated: November 8, 1978.

ROBERT B. LAGATHER,
Assistant Secretary, for Mine Safety and Health.

PART 55—SAFETY AND HEALTH STANDARDS—METAL AND NONMETALLIC OPEN PIT MINES

Part 55, Subchapter N, Chapter I, Title 30, Code of Federal Regulations is amended and revised as follows:

A. Section 55.2 "Definitions" is amended by revising the definition of the term "Potable" as follows:

§ 55.2 Definitions

* * * * *

"Potable water" means water which shall meet the applicable minimum health requirements for drinking water established by the State or community in which the mine is located or by the Environmental Protection Agency in 40 CFR Part 141, pages 169-182 revised as of July 1, 1977. Where no such requirements are applicable, the drinking water provided shall conform with the Public Health Service Drinking Water Standards, 42 CFR Part 72, Subpart J, pages 527-533, revised as of October 1, 1976. Publications to which references are made in this definition are hereby made a part hereof. These incorporated publications are available for inspection at each Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration.

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§ 55.5 [Amended]

B. Section 55.5 "Air Quality and Physical Agents" is amended as follows:

1. Paragraph (b) of mandatory standard 55.5-1 is revised as follows:

55.5-1 *Mandatory.* * * *

* * * * *

(b) The 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 2 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400- 450 magnification (4 millimeter objective) phase contrast illumination. No employees shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophylite asbestos, tremolite asbestos, and actinolite asbestos.

* * * * *

2. New mandatory standard 55.5-6 is added as follows:

55.5-6 *Mandatory.* The following chemical substances shall not be used or stored except by competent persons under laboratory conditions approved by a nationally recognized agency acceptable to the Secretary.

(a) Carbon tetrachloride,
(b) Phenol,
(c) 4-Nitrobiphenyl,
(d) Alpha-naphthylamine,
(e) 4,4-Methylene Bis (2-chloroaniline),
(f) Methyl-chloromethyl ether,
(g) 3,3 Dichlorobenzidine,
(h) Bis (chloromethyl) ether,
(i) Beta-napthylamine,
(j) Benzidine,
(k) 4-Aminodiphenyl,
(l) Ethylenediamine,
(m) Beta-propiolactone,
(n) 2-Acetylaminofluorene,
(o) 4-Dimethylaminobenzene, and
(p) N-Nitrosodimethylamine.

3. New mandatory standard 55.5-10 is added as follows:

55.5-10 *Mandatory.* Silica sand, or other materials containing more than 1 percent free silica, shall not be used as an abrasive substance in abrasive blasting cleaning operations without requiring full-flow respiratory protection, or equivalent, to all exposed persons.

(Sec. 508, Pub. L. 91-173 as amended by Pub. L. 95-164, 83 Stat. 803 (30 U.S.C. 957), and Sec. 301(c)(3), Pub. L. 95-164, 91 Stat. 1318 (30 U.S.C. 961).)

PART 56—SAFETY AND HEALTH STANDARDS—SAND, GRAVEL, AND CRUSHED STONE

Part 56, Subchapter N, Chapter I, Title 30, Code of Federal Regulations is amended and revised as follows:

C. Section 56.2 "Definitions" is amended by revising the definition of the term "Potable" to read as follows:

§ 56.2 Definitions

* * * * *

"Potable water" means water which shall meet the applicable minimum health requirements for drinking water established by the State or community in which the mine is located or by the Environmental Protection Agency in 40 CFR Part 141, pages 169-182 revised as of July 1, 1977. Where no such requirements are applicable, the drinking water provided shall conform with the Public Health Service Drinking Water Standards, 42 CFR Part 72, Subpart J, pages 527-533, revised as of October 1, 1976. Publications to which references are made in this definition are hereby made a part hereof. These incorporated publications are available for inspection at each Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration.

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§ 56.5 [Amended]

D. Section 56.5 "Air Quality and Physical Agents" is amended as follows:

1. Paragraph (b) of mandatory standard 56.5-1 is revised as follows:

56.5-1 *Mandatory.*

* * * * *

(b) The 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 2 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400-450 magnification (4 millimeter objective) phase contrast illumination. No employees shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophylite asbestos, tremolite asbestos, and actinolite asbestos.

* * * * *

2. New mandatory standard 56.5-6 is added as follows:

56.5-6 *Mandatory.* The following chemical substances shall not be used or stored except by competent persons under laboratory conditions approved by a nationally recognized agency acceptable to the Secretary.

(a) Carbon tetrachloride,
(b) Phenol,
(c) 4-itrobiphenyl,
(d) Alpha-naphthylamine,
(e) 4,4-Methylene Bis (2-chloroaniline),
(f) Methyl-chloromethyl ether,
(g) 3,3 Dichlorobenzidine,
(h) Bis (chloromethyl) ether,
(i) Beta-napthylamine,
(j) Benzidine,
(k) 4-Aminodiphenyl,
(l) Ethylenediamine,
(m) Beta-propiolactone,
(n) 2-Acetylaminofluorene,
(o) 4-Dimethylaminobenzene, and
(p) N-Nitrosodimethylamine.

3. New mandatory standard 56.5-10 is added as follows:

56.5-10 *Mandatory.* Silica sand, or other materials containing more that 1 percent free silica, shall not be use as an abrasive substance in abrasive blasting cleaning operations without requiring full-flow respiratory protection, or equivalent, to all exposed persons.

(Sec. 508, Pub. L. 91-173 as amended by Pub. L. 95-164, 83 Stat. 803 (30 U.S.C. 957), and Sec. 301(c)(3), Pub. L. 95-164, 91 Stat. 1318 (30 U.S.C. 961).)

PART 57—SAFETY AND HEALTH STANDARDS—METAL AND NONMETALLIC UNDERGROUND MINES

Part 57, Subchapter N, Chapter I, Title 30, Code of Federal Regulations is amended and revised as follows:

E. Section 57.2 "Definitions" is amended by revising the definition of the term "Potable" is to read as follows:

§ 57.2 Definitions

* * * * *

"Potable water means water which shall meet the applicable minimum health requirements for drinking water established by the State or community in which the mine is located or by the Environmental Protection Agency in 40 CFR Part 141, pages 169-182 revised as of July 1, 1977. Where no such requirements are applicable, the drinking water provided shall conform with the Public Health Service Drinking Water Standards, 42 CFR Part 72, Subpart J, pages 527-533, revised as of October 1, 1976. Publications to which references are made in this definition are hereby made a part hereof. These incorporated publications are available for inspection at each Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration.

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§ 57.5 [Amended]

F. Section 57.5 "Air Quality, Ventilation, Radiation, and Physical Agents" is amended as follows:

1. Paragraph (b) of mandatory standard 57.5-1 which is applicable to surface and underground is revised as follows:

57.5-1 *Mandatory.*

* * * * *

(b) The 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 2 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400-450 magnification (4 millimeter objective) phase contrast illumination. No employees shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophylite asbestos, tremolite asbestos, and actinolite asbestos.

* * * * *

2. New mandatory standard 57.5-6 which is applicable to surface and underground is added as follows:

57.5-6 *Mandatory.* The following chemical substances shall not be used or stored except by competent persons under laboratory conditions approved by a nationally recognized agency acceptable to the Secretary.

(a) Carbon tetrachloride,
(b) Phenol,
(c) 4-Nitrobiphenyl,
(d) Alpha-naphthylamine,
(e) 4,4-Methylene Bis (2-chloroaniline),
(f) Methyl-chloromethyl ether,
(g) 3,3 Dichlorobenzidine,
(h) Bis (chloromethyl) ether,
(i) Beta-napthylamine,
(j) Benzidine,
(k) 4-Aminodiphenyl,
(l) Ethylenediamine,
(m) Beta-propiolactone,
(n) 2-Acetylaminofluorene,
(o) 4-Dimethylaminobenzene, and
(p) N-Nitrosodimethylamine.

3. New mandatory standard 57.5-10 which is applicable to surface only is added as follows:

57.5-10 *Mandatory.* Silica sand, or other materials containing more than 1 percent free silica, shall not be used as an abrasive substance in abrasive blasting cleaning operations without requiring full-flow respiratory protection, or equivalent, to all exposed persons.

4. New mandatory standard 57.5-16 which is applicable to underground only is added as follows:

57.5-16 *Mandatory.* Silica sand, or other materials containing more than 1 percent free silica, shall not be used as an abrasive substance in abrasive blasting cleaning operations.

(Sec. 508, Pub. L. 91-173 as amended by Pub. L. 95-164, 83 Stat. 803 (30 U.S.C. 957), and Sec. 301(c)(3), Pub. L. 95-164, 91 Stat. 1318 (30 U.S.C. 961).)

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